

ABSTRACT

A lateral double diffused MOSFET (LDMOST) incorporates both the reduced surface field (RESURF) and super junction (SJ) in a split-drift region to significantly improve the on-state, off-state and switching characteristics in junction-isolated (JI) technology. The structure effectively suppresses substrate-assisted-depletion which is the main problem encountered when applying the SJ concept to lateral power devices. The device structure features a split-drift region formed of two parts: a SJ structure that extends over most of the drift region, and a terminating RESURF region occupying a portion of the drift region next to the drain. The structure offers improved breakdown voltage and reduced specific on resistance as compared to convention structures, and is useful in power integrated circuits suitable for a variety of applications including flat plasma panel display, automotive electronics, motor control, power supply and high voltage lamp ballasts.